

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	0	("fusedimidazole").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2006/05/05 17:21
S2	398088	fused imidazole	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 14:18
S3	515170	fused imidazole and neurodegenerative disorder	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/05 17:23
S4	514976	fused imidazole with neurodegenerative disorder	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/05 17:23
S5	1437	(fused imidazole) with (neurodegenerative disorder)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/10 12:11
S6	2	"6855711"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/05 18:12
S7	2	"6531464"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/05 18:17
S8	2	"6175015"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/05 18:19
S9	5	"6133299"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/05 18:19

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S10	2	"6737424"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/05 18:45
S11	384	"fused imidazole"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 15:33
S12	19	"fused imidazole" and "neurodegenerative disorders"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 14:54
S13	19	("fused imidazole") and ("neurodegenerative disorders")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 14:55
S14	3	"20030130289"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 15:41
S15	3	"6900214"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 15:44
S16	6	"6900218"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 15:45
S17	2	"6960685"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 15:48
S18	2	"6417189"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/09 15:51
S19	5	"6696039"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/10 09:43

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S20	4	"6696039"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 16:41
S21	2525560	neurodegenerative disorder increased neurons	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 16:42
S22	2525560	neurodegenerative disorder increased neurons	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 16:42
S23	216	(neurodegenerative disorder increased neurons)and (S11)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:14
S24	173	(neurodegenerative disorder "increased neurons")and (S11)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:11
S25	1	(neurodegenerative disorder "increased neurons")and (S11)and (neurogenesis)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:12
S26	1	(neurodegenerative disorder "increased neurons")and (S11)and neurogenesis	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:12
S27	1	(neurodegenerative disorder increased neurons)and (S11)and neurogenesis	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:12
S28	2519076	neurodegenerative disorder increased neurons and (S11)and neurogenesis	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:13
S29	1	(neurodegenerative disorder increased neurons) and (S11)and neurogenesis	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:13
S30	0	neurodegenerative disorder increased neurons and (S11)and neurogenesis	US-PGPUB; USPAT; USOCR; EPO; JPO	AND	ON	2006/05/09 18:13
S31	0	neurodegenerative disorder increased neurons and (S11)and neurogenesis	US-PGPUB; USPAT; USOCR; EPO; JPO	WITH	ON	2006/05/09 18:13

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S32	1	(neurodegenerative disorder increased neurons)and (S11)and neurogenesis	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:14
S33	31	(neurodegenerative disorder increased neurons)and (S11)and neurons	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:53
S34	2	"9839343"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:56
S35	4	"6518273"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 18:59
S36	14	"5334606"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:00
S37	38658	fuzed imidazole with increase neurons	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:00
S38	484	(fuzed imidazole) with (increase neurons)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:40
S39	6988	(fused imidazole) with (increase neurons)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:03
S40	7	(fused imidazole) with (neurogenesis)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:01
S41	184417	(fused imidazole)and (increase neurons)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:02
S42	7	"6048896"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:04
S43	89	"6239288"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:35

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S44	103205	neuron growth and fused imadzole	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:36
S45	80155	(neuron growth) and fused imadzole	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:36
S46	80153	(neuron growth) and (fused imadzole)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:36
S47	3868	(neuron growth) with (fused imadzole)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:36
S48	32	("neuron growth") with (fused imadzole)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:37
S49	0	("neuron growth") with ("fused imidazole")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:37
S50	0	("neuron growth") and ("fused imidazole")	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:38
S51	253	("neuron growth") and (fused imidazole)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:39
S52	0	("neuron growth") and (fused imidazole)and neurodegenerative	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:39
S53	0	("neuron growth") and (fused imidazole)and (neurodegenerative)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 19:40
S54	523	(fuzed imidazole) with (increase neurons alzheimers)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 20:24
S55	0	"200162704"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 20:25

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S56	3	"0162704"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 20:25
S57	1	"2000162704"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 20:25
S58	2	"00162704"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2006/05/09 20:25
S59	2	"20020107273"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/10 10:28
S60	8	"6284539"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/10 10:28
S61	3	"9936415"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/10 12:25
S62	2	"6699871"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2006/05/10 12:25

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Journal of Clinical Laser Medicine & Surgery

Modulator of Heme Biosynthesis Induces Apoptosis in Leukemia Cells

Apr 2001, Vol. 19, No. 2: 59-67

Natalie Rebeiz, PhD, Sean Arkins, PhD, K.W. Kelley, PhD, Gary Durack, MS, Constantin A. Rebeiz, PhD

Objective: The purpose of this research is the investigation of the possible cause(s) of the dark-cell death phenomenon induced by 1,10-phenanthroline (Oph), a porphyrin biosynthesis modulator. **Summary Background Data:** We have previously shown that porphyrin biosynthesis modulators, such as Oph, which is also an ironchelating agent, enhance protoporphyrin IX (Proto) accumulation in mammalian neoplastic cells treated with δ-aminolevulinic acid (ALA). As a result of the enhanced Proto accumulation, a significant increase in photo-dynamic damage was observed under illumination. Also tetrapyrrole and heme-biosynthesis modulators have been shown to cause death in treated insect larvae in darkness, a phenomenon referred to as dark-cell death. Dark-cell death was also observed in Oph + ALA-treated transformed mammalian cells. **Methods:** Neoplastic cells were treated with ALA, Oph, and ALA + Oph, and the following cell properties were investigated: growth arrest, membrane permeability, cell survival, nucleosomal cleavage, and cell cycle alterations. **Results:** It was observed that Oph but not ALA induced growth arrest, in a T-cell leukemia line (MLA 144) as assessed by reduction in DNA synthesis. Exogenous Proto and isomers of Oph lacking the iron-chelating property of Oph also caused a dose-dependent inhibition of proliferation in MLA 144 cells. Although the plasma membrane of Oph-treated cells remained intact following 3 h of dark-incubation, the cells exhibited DNA internucleosomal cleavage, characteristic of cells undergoing apoptosis. Cell cycle analysis using the DNA intercalating dye propidium iodide (PI) coupled to flow cytometry, indicated that $81 \pm 5.6\%$ of Oph-treated MLA 144 cells were apoptotic, with the majority of the cells arrested in the early S phase. On the other hand, treatment with either ALA or Proto did not alter the cell cycle. Also, using a double-labeling protocol with Hoechst 33342, and PI, and analysis by flow cytometry, Oph-treated cells were found to be 82% apoptotic after 3 h of dark-incubation. Apoptosis was reduced by 75% ($p < 0.05$) by the cytoplasmic protein synthesis inhibitor cycloheximide. **Conclusions:** These results indicate that in addition to enhancing Proto accumulation, the heme biosynthesis modulator Oph also induces growth arrest and apoptosis in transformed cells in darkness.

This paper was cited by:

Histone hypoacetylation is involved in 1,10-phenanthroline–Cu²⁺-induced human hepatoma cell apoptosis

[Jiuhong Kang, Jie Chen, Yufeng Shi, Jie Jia, Zhenhua Wang](#)

[JBIC Journal of Biological Inorganic Chemistry. 2005, Vol. 10, No. 2: 190](#)

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